March 4, 1941. G. H. BURT 2,233,909

ELECTRICAL PLUG

Filed Aug. 29, 1938

Fig. 1.

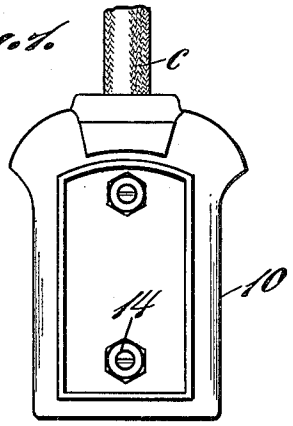


Fig. 2.

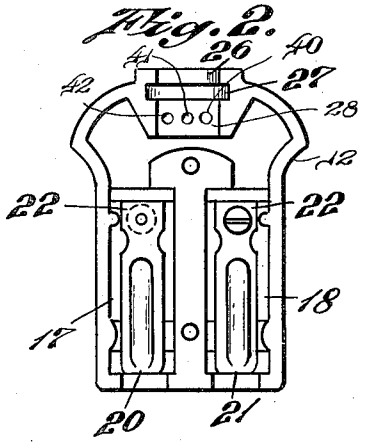


Fig. 3.

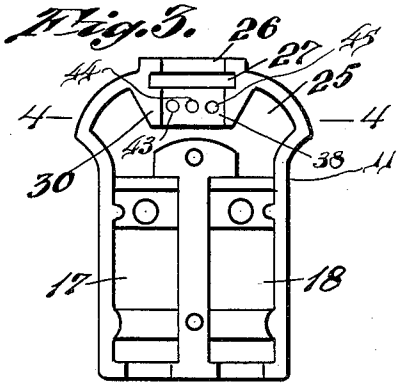
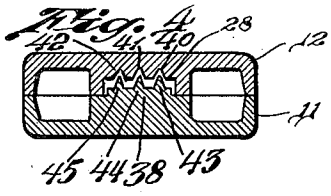


Fig. 4.



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2,233,909

UNITED STATES PATENT OFFICE

2,233,909

ELECTRICAL PLUG

Guy H. Burt, Providence, R. I.

Application August 29, 1938, Serial No. 227,262

1 Claim. (Cl. 173—322)

This application is a continuation in part of my pending application Serial No. 197,557, filed March 23, 1938 and issued as Patent No. 2,128,883.

This invention relates to an electrical connector or plug, and more particularly to an improved electrical cord connector plug of the type commonly employed to attach a circuit cable or extension cord to a heater such as an electric iron, toaster or other electrical appliance.

An object of the invention is to provide an improved electrical connector construction having means whereby the electrical contacts and the connector wires attached thereto within the plug are relieved from extreme pulling strains such as when the plug is withdrawn from the socket of the appliance by seizure of the cable.

Another object of the invention is to provide an improved cord connector plug construction having means for firmly gripping and anchoring the extension cord or cable thereto whereby the plug may be easily separated from the socket by a straight axial pull on the cable without inflicting detrimental strain on either the connector wires or the contacts within the plug structure.

Another object of the invention is the provision of an electrical cord connector of the above character having anchoring means for the extension cord as it emerges from the plug designed so as to relieve the contact and connector wires within the structure from torsional strain when the extension cord is subjected to a torque by being twisted.

Another object of the invention is to provide an electrical plug and cord assembly in which the grip on the cord will be sufficient to prevent within certain tolerances a pull or torque applied to the cord outside of the plug from being so transmitted to the part of the cord within the plug as to cause a movement of the cord parts within the plug beyond certain limits.

Another object of the invention is the provision of a pair of members so shaped that they may be molded with all parts of each of the members integral with its member and with no undercut or overhanging portions which would prevent the same from being withdrawn from a mold.

A further object of the invention is to provide the gripping portions of the members which engage the cord in spaced relation so that two distinct points of gripping may be had to one assist the other in performance of the desired holding function.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claim.

In the accompanying drawing:

Fig. 1 is a vertical elevational view of an electrical cord connector plug formed of a pair of sections in opposed face to face relation embodying my invention;

Fig. 2 is an elevational view of the connector plug structure in Fig. 1 but with the front section removed;

Fig. 3 is a detail view, in elevation, of the front section of the connector plug structure in Fig. 1, showing the anchoring means for the extension cord; and

Fig. 4 is a sectional view substantially on line 4—4 of Fig. 3 but showing both front and rear plug sections together.

It is well-known practice in the use of ordinary electrical cord attachment plugs that such devices are many times withdrawn from the socket of the electrical appliance by seizure and sudden jerking of the cable or extension cord, thereby causing extreme strain to be imposed on the connection wires of the cable with the contacts of the plug and consequently resulting in a rapid destruction and deterioration of the portion of the cable adjacent to the plug. Further, twisting of the cord often occurs causing a different strain to be transmitted to and into the plug. The strain placed on these extension cords under these conditions often is of such force that many times the connector wires of the cable where they are attached to the metal contacts of the plug are broken and short circuits result; and in order to obviate such difficulties I have provided an electrical cord connector plug construction having means disposed within the plug so constructed and arranged as to prevent the connection between the wires and the contacts within the plug from being materially strained by reason of excessive tension or torque being transmitted thereto if the cable is pulled or twisted; and in order to accomplish these advantageous results I have provided in each of the sections of the connector plug adjacent the rear opening thereof through which the extension cord extends into the connector block, anchoring means adapted to bind or bite into exterior portions of the cable or extension cord that is clamped between the sections for firmly gripping and holding the cord preferably at oppositely disposed points upon sections of the plug in opposed face to face relation whereby any force applied to the cable will be borne by such anchoring and grip-

ping means of the plug and will so relieve the cord within the plug that these forces will not be imposed to a substantial degree or a degree to cause detrimental movement upon the connector wires within the plug, all of which may be done in a molding operation of the sections; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished.

With reference to the drawing, 10 designates generally the electrical cord connector or attachment plug and comprises a body member generally oblong in cross-section formed of opposed halves or sections 11 and 12 of Bakelite, hard rubber or other suitable hard insulating material. The sections 11 and 12 are of substantially identical construction and they are held in face to face contact with each other by means of suitable screws 14 and nuts, as is the usual construction of such connector plugs. The opposed abutting faces of the sections 11 and 12 are formed with spaced complementary longitudinal grooves or recesses of generally rectangular cross-section 17 and 18 which cooperate to form parallel contact housing channels or sockets extending inwardly from the forward end of the connector plug when the body pieces 11 and 12 are clamped together. The shape of these channels is not material so long as they receive and generally fit the contacts of the plug.

In each of these sockets in the front of the insulating plug comprising sections 11 and 12 there is mounted a pair of opposed resilient metal contacts 20 and 21 which are of the usual construction employed for connector plugs of this type, and are of substantially semi-tubular formation from sheet stock. The contacts 20 and 21 each present split terminal sockets for the reception of the contact prongs or blades carried by the electrical appliance. As shown in Fig. 2, the inner ends of each pair of the contacts 20 and 21 are flattened, as indicated at 22, and they are fixed to the plug consisting of sections 11 and 12 in any suitable and well-known manner. The grooves 17 and 18 in the sections 11 and 12 are of a size sufficient to leave a slight clearance between the contact strips 20 and 21 respectively, in order to permit the same to expand laterally when in tight gripping engagement with the inserted terminal pins, blades or prongs of the usual appliance.

As shown in Fig. 3, each section of the plug body is hollow and provided with a laterally disposed chamber 25 of suitable wire receiving formation for accommodating the connector wires of the extension cord C, the forward portion of the chamber 25 communicating with the rear end portions of the recesses 17 and 18 to permit passage of the connector wires for attachment to the wiring terminal ends of said contacts 20 and 21. Formed in the rear wall of the sections are a series of axially disposed semi-cylindrical recesses 26 and 27 which are of stepped formation and which provide in the assembly of the sections of the plug cylindrical openings. These openings communicate with the chamber 25 in the plug by means of an axially disposed recess 28 provided in the section 12. The opening 27 is made of larger diameter than the opening 26 and is adapted to receive and hold the usual flanged sleeve, not shown, through which the extension cord C extends into the interior of the connector plug, and in which the usual cord encircling spring, not shown, is anchored, as the common construction of such cord connector plugs.

In order to tightly grip and anchor the cord secured to the plug connector against considerable torsional movement or excessive outward pulling and to prevent the transmission of strain to the connector wires and contacts within the plug, the inner surface of section 11 is provided with a projection 38 to fit into the recess 28 and yet leave a space between the recess and projection when assembled for the accommodation of a cord which will be deformed when the cord is assembled between the two sections into such a formation that twisting or pulling strain will not be transmitted into the connection with the contacts 20 and 21 at the points 22.

The recess 28 is provided with further recesses 40, 41 and 42 and the projection 38 is provided with additional smaller projections or spurs 43, 44 and 45 opposite these recesses 40, 41 and 42 to further deform the cord or pierce the outer surface thereof to additionally hold it firmly in position.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claim.

I claim:

An electrical cord connector plug comprising a body of insulating material formed in two members each having an abutting face to contact the other, said members providing complementary recesses at one end forming contact housing channels when the body pieces are together, said body members being provided at the other end with a passage at the rear end of the plug body communicating with said channels providing an entrance for the connector wires of an extension cord for connection to the wiring terminals of the contact members, said passage being formed by a main recess and a plurality of minor recesses in one member and a plurality of projections on the other member extending into said recess and but partially into the minor recesses to leave an opening of a character to deform a cord positioned in said opening and cause gripping of the same sufficiently to prevent substantial twisting of the cord in the opening or slipping of the cord relative to the body members.

GUY H. BURT.